Half Yearly Examination 2017-2018

Std. : IX **Full Marks : 80**

Subject : MATHEMATICS **Time : 2½ Hrs+15mins.**

Section A [40 marks]

(Attempt all questions)

1. a) Factorise $x^6 - 7x^3 - 8$ [3]

(b) Solve for x & y [3]

$$\frac{30}{x-y} + \frac{44}{x+y} = 10$$

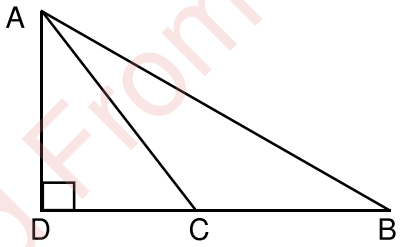
$$\frac{40}{x-y} + \frac{55}{x+y} = 13$$

(c) Solve the following equations for x [2x20]

(i) $\sqrt{(8^{O} + {}^{2}/_{3})} = (0.6)^{2-3x}$

(ii) $9^{x+2} = 240 + 9^{x}$

2. (a) Find CD if $\angle D = 90^{O}$ AB = 16 cm BC = 12 Cm CA = 6 cm. [4]



(b) The centre of a circle is (2a, a-7), find 'a' if circle pases through the point (11,-9) and had diamter $10\sqrt{2}$ units. [3]

(c) Find mean, median and mode of 8, 0, 5, 3, 2, 2, 1, 2, 4, 7, 2, 5. [3]

3. ABC is a triangle right angled at C. A line through the mid point M of hypotenuse AB and parallel to BC intersects AC at D show that. [5]

(a) (i) D is mid point of AC (ii) MD $\perp$ AC

(iii) CM = MA = ½ AB.

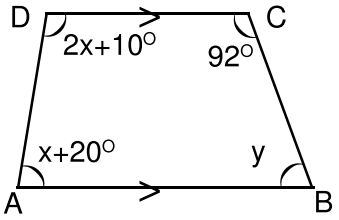
3. (b) Using ruler and compasses only, construct a parallelogram ABCD in which AB = 4.6 cm BC = 3.2 cm and AC = 6.1 cm. [5]

4. (a) Calculate mean by short cut method. [4]

CI	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60
f	4	10	6	8	5	9

4. (b) What sum will amount to Rs. 2782.50 in 2 years at CI, if the rates are 5% and 6% for the successive years. [5]

(c) ABCD is a trapezium. find the values of x and y. [3]



Section B
(Attempt any four questions)

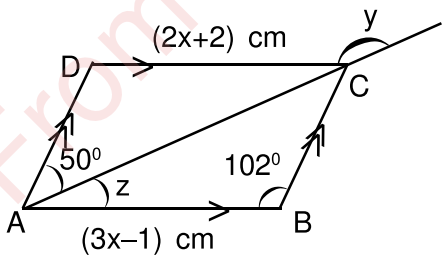
5. a) Find the co-ordinates of the centre of the circle passing through A (5,1) B (–3, –7) and c (7, –1) [5]

b) Construct a regular hexagon of side 4cm and construct its incircle measure radius. [5]

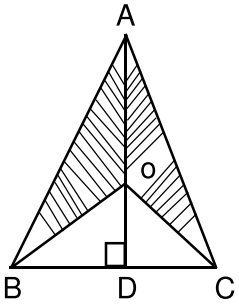
6. a) The result of dividing a number of two digits by the number with the digits reversed is 5/6. If the difference of digits is 1. find the number. [4]

b) Simplify $\left(\frac{1}{4}\right)^{-2} - 3\,(8)^{2/3}\,(4)^{O} + \left(\frac{9}{16}\right)^{-½}$ [3]

c) In the adjoining figure, ABCD is parallelogram find the values of x, y and z. [3]



7. a) In the adjoining figure, ABC is an isosceles triangle with BC = 8 cm AB = AC = 12 cm. AD is perpendicular to BC and O is a point on AB such that ∠BOC = 90° find the area of shaded portion. [5]



b) Draw a histogram and frequence polygon find the mode and model class of the following Data. [5]

CI	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70	70 – 80
f	18	10	12	24	18	13

8. (a) The monthly income of a group of 320 employees in a company is given below. [6]

Montly Income	6000–7000	7000–8000	8000–9000	9000–10000	10000–11000	11000–12000	12000–13000
no. of Employees	20	45	65	95	60	30	5

Draw an ogive of the given distribution on a graph sheet taking 2cm = Rs. 1000 on one axis and 2 cm = 50 employees.

Determine (i) median (ii) the number of employees whose income is below Rs. 8500.

(iii) the upper quartile. (iv) find the number of senior employees whose income above 11500.

8. (b) Find x & y $99x + 101y = 499xy$ [4]
$101x + 99y = 501xy$

9. (a) The parallel sides of an isosceles trapezium are in the ratio 2:3. If its height is 4 cm and area is $60cm^2$. Find the perimeter. [4]

(b) Use graph paper to answer this questions. [6]

(i) Plot the points A (4,6) and B (1,2)

(ii) If A' is the image of A when reflected in the x axis. write the coordinates of A'.

(iii) If B is the image of B when reflected in the line AA'. Write the coordinates of B'.

(iv) Give the geometrical name for the figure AB A'B'.

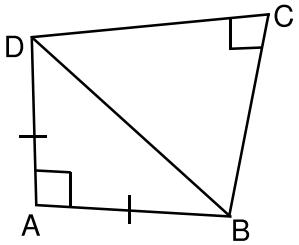
10. (a) A sum of money is invested at compound interest payable annually. The interest in two successive years is Rs. 225 and Rs. 240. Find (i) the rate of interest. (ii) the original sum. (iii) the interest earned in the third year. [5]

(b) Using distance formulae, show that the points A (3,1) B (6,4) and C (8,6) are collinear. [3]

(c) Factorise $x^3 + 3x^2y + 3xy^2 + 2y^3$ [2]

11. (a) ABCD is quadulateral in which AB = AD $\angle A = 90^\circ = \angle C$, BC = 8 cm and CD = 6 cm. Find AB and area of ΔABD.

(b) Mohan has a recurring deposit account in a bank for 2 years at 6% p.a. simple Interest. If he gets Rs. 1200 as interest at the time of maturity find Monthly instalment and amount of maturity. [4]



(c) $x = \sqrt[3]{28}$ $y = \sqrt[3]{27}$ [2]

find $x^3 - y^3$